

REMARKS

The present Amendment amends claims 1, 6-10 and 15 and leaves claims 2-5, 11-14 and 16-18 unchanged. Therefore, the present application has pending claims 1-18.

The Abstract stands objected to due to informalities noted by the Examiner in paragraph 1 of the Office Action. Amendments were made to the Abstract to correct the informalities noted by the Examiner. Therefore, this objection is overcome and should be withdrawn.

Claims 1-9, 13 and 14 stand rejected under 35 USC §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regards as their invention. Various amendments were made throughout claims 1-9, 13 and 14 to bring them into conformity with the requirements of 35 USC §112, second paragraph. Therefore, Applicants submit that this rejection is overcome and should be withdrawn.

Claim 10 stands rejected under 35 USC §102(b) as being anticipated by Ma (U.S. Patent No. 5,953,338); claims 1-4, 6, 9, 11-13, 15 and 18 stand rejected under 35 USC §103(a) as being unpatentable over Ma; claims 5 and 14 stand rejected under 35 USC §103(a) as being unpatentable over Ma in view of Norizuki (U.S. Patent No. 5,357,510); and claims 7, 8, 16 and 17 stand rejected under 35 USC §103(a) as being unpatentable over Ma in view of Umehira (U.S. Patent No. 6,188,697). These rejections are traversed for the following reasons. Applicants submit that the features of the present invention as now more clearly recited in claims 1-18 are not taught or suggested by Ma, Norizuki or Umehira whether taken individually or in combination with each other as suggested by the Examiner.

Therefore, Applicants respectfully request the Examiner to reconsider and withdraw these rejections.

Amendments were made to the claims to more clearly recite that the present invention is directed to an Asynchronous Transfer Mode (ATM) communication apparatus in a point-to-multiple point optical transfer system where the ATM communication apparatus is connected to a plurality of optical network units through an optical branching device and the ATM communication apparatus receives a multiplexed signal obtained when the optical branching device, multiplexes optical signals transmitted by the optical network units, branches an optical signal at the optical branching device to transmit to the optical network units, and sends to each of the optical network units by using a certain area in an ATM cell, transmission timing and a transmission bandwidth of an ATM cell to be transmitted to the ATM communication apparatus to give an access right to control a communication bandwidth to perform ATM cell receiving control in the optical transfer system.

According to the present invention, the ATM communication apparatus includes a traffic supervisory unit for supervising a traffic situation of ATM cells sent to the ATM communication apparatus from the optical network units, the transmission supervisory unit includes a supervisory unit of a receiving bandwidth for detecting the receiving bandwidth for receiving ATM cells from each of the optical network units and a supervisory unit of cell overflow situation for detecting a cell overflow situation of a sending buffer of ATM in each of the optical network units.

Further, the ATM communication apparatus includes a bandwidth controller having a basic bandwidth assignor for assigning a basic bandwidth for sending ATM cells to each of the optical network units, an upper-limit bandwidth storage means for

storing an upper-limit bandwidth set as upper-limit of bandwidth which is usable for transmission of ATM cells of each of the optical network units, a shared bandwidth assignor for assigning a shared bandwidth which is usable with the basic bandwidth to each of the optical network units according to value of the upper-limit bandwidth based on a receiving bandwidth and cell overflow situation that were supplied from the traffic supervisory unit and the shared bandwidth storage means for storing the shared bandwidth assigned to each of the optical network units by the shared bandwidth.

Still further, the ATM communication apparatus of the present invention includes a generator of access permission for generating access permission to assigned optical network units according to the shared bandwidth assigned according to the shared bandwidth assignor.

Thus, by use of the above described features of the present invention a bandwidth control method and an ATM communication apparatus in a system that uses time division multiple access (TDMA) method is provided. The present invention aids in providing a easy to use method for assigning a limited bandwidth to a plurality of optical network units according to the subscribers' contracts when the TDMA method is used. Thus, the present invention operates in a point-to-multiple point optical transfer system where an ATM communication apparatus is connected to a plurality of optical network units through an optical branching device. The present invention provides the unique advantages that time consuming implementation of contract details can be specified for each user according to the bandwidth available. Such features are not possible nor are they taught or suggested by the references of record.

Ma relates to a call control management system in which a management unit is provided that collectively manages the generation and deletion (call control) of Virtual Connections (VCEs) for a plurality of ATM switches and if a user exceeds the upper bandwidth limit specified by a contract then the management unit deletes the corresponding VC.

The present invention as recited in the claims differs substantially from that taught by Ma being that the present invention relates to a situation where signals are transmitted and received by the TDM method after a call have already been established. According to the present invention, the ATM communication apparatus is connected to a plurality of user terminals through an optical branching device. Such features are clearly not taught or suggested by Ma.

Thus, Ma fails to teach or suggest an Asynchronous Transfer Mode (ATM) communication apparatus in a point-to-multiple point optical transmission system where the ATM communication apparatus is connected to a plurality of optical network units through an optical branching device, and the ATM communication apparatus receives a multiplex signal obtained from the optical branching device, multiplexes optical signals transmitted by the optical network units and branches an optical signal at the optical branching device to transmit to the optical network units as recited in the claims.

Further, Ma fails to teach or suggest that the ATM communication apparatus sends to each of the optical network units by using a certain area in an ATM cell, transmission timing and a transmission bandwidth of an ATM cell to be transmitted to the ATM communication apparatus to give an access right to control a

communication bandwidth to perform ATM cell receiving control in the optical transfer system as recited in the claims.

Still further, Ma fails to teach or suggest a bandwidth controller having a basic bandwidth assignor for assigning a basic bandwidth for sending ATM cells to each optical network units, an upper-limit bandwidth storage means for storing an upper-limit bandwidth such as upper-limit of bandwidth which is usable for transmission of ATM cells of each of the optical network units, a shared bandwidth assignor for assigning a shared bandwidth which is usable with the basic bandwidth to each of the optical network units according to value of the upper-limit bandwidth based on a receiving bandwidth and cell flow situation that were supplied from the traffic supervisory unit and the shared bandwidth storage means for storing the shared bandwidth assigned to each of the optical network units by the shared bandwidth as recited in the claims.

Therefore, as is quite clear from the above, Ma fail to teach or suggest the features of the present invention as now more clearly recited in the claims.

Accordingly, reconsideration and withdrawal of the 35 USC §102(b) and 35 USC §103(a) rejections of claims 1-4, 6, 9-13, 15 and 18 as being anticipated by or as being unpatentable over Ma is respectfully requested.

The above described deficiencies of Ma are not supplied by any of the other references of record, namely Norizuki or Umehira. Norizuki relates to a bandwidth control method known as an available bit rate (ABR) method. In the ABR method taught by Norizuki a special cell call an RM cell is transmitted and received to change the bandwidth of a terminal. In Norizuki, both a control apparatus and each user terminal need the RM cell termination units.

The present invention differs substantially from that taught by Norizuki being that the present invention is directed to an ATM communication apparatus which controls the assignment of a bandwidth to each terminal in an optical transfer system. Such features are clearly not taught or suggested by Norizuki. In fact, the same arguments presented above distinguishing the features of the present invention from the references of record from Ma also apply as well to the use of Norizuki to reject the claims of the present application.

Umehira relates to an ATM cell discharge processing in a terminal. This teaching of Umehira is only with respect to terminals and that such terminals include queues having different levels of priority. Umehira teaches that depending on a traffic condition a determination is made whether a queue from which cells are to be read according to the levels of priority among the queues.

The present invention as described above is directed to an ATM communication apparatus which controls the bandwidth of each user terminal in an optical transfer system. Such apparatus is not taught or suggested by Umehira. In fact, the above described features of the present invention shown above not to be taught or suggested by either Ma or Norizuki are also not taught or suggested by Umehira.

Thus, as is clear from the above, each of the references Ma, Norizuki and Umehira suffers from the same deficiencies relative to the features of the present invention as now more clearly recited in the claims. Therefore, combining the teachings of Ma with one or more of Norizuki or Umehira still fails to teach or suggest the features of the present invention as now more clearly recited in the claims. Accordingly, reconsideration and withdrawal of the 35 USC §103(a) rejections of

claims 5, 7, 8, 14, 16 and 17 as being unpatentable over Ma in combination with one or more of Norizuki and Umehira is respectfully requested.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references utilized in the rejection of claims 1-18.

In view of the foregoing amendments and remarks, applicants submit that claims 1-18 are in condition for allowance. Accordingly, early allowance of claims 1-18 is respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C., Deposit Account No. 50-1417 (572.39563X00).

Respectfully submitted,

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